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UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the updates.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
2.020	19/07/2010	FI	All	Software changed (v1.900)(v1.200)
2.030	22/09/2010	FI	All	Software changed (v2.200)(v2.200)
2.040	05/11/2010	FI	All	Software changed (v2.203)
2.050	02/12/2010	FI	All	Software changed (v2.300)
2.051	19/01/2011	FI	All	Revision
2.052	01/02/2012	FI	All	Revision

WARNING:

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ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

All trademarks mentioned in this document belong to their respective owners.

CONNECTION SCHEME:

Order Code: **HD67029M-232**

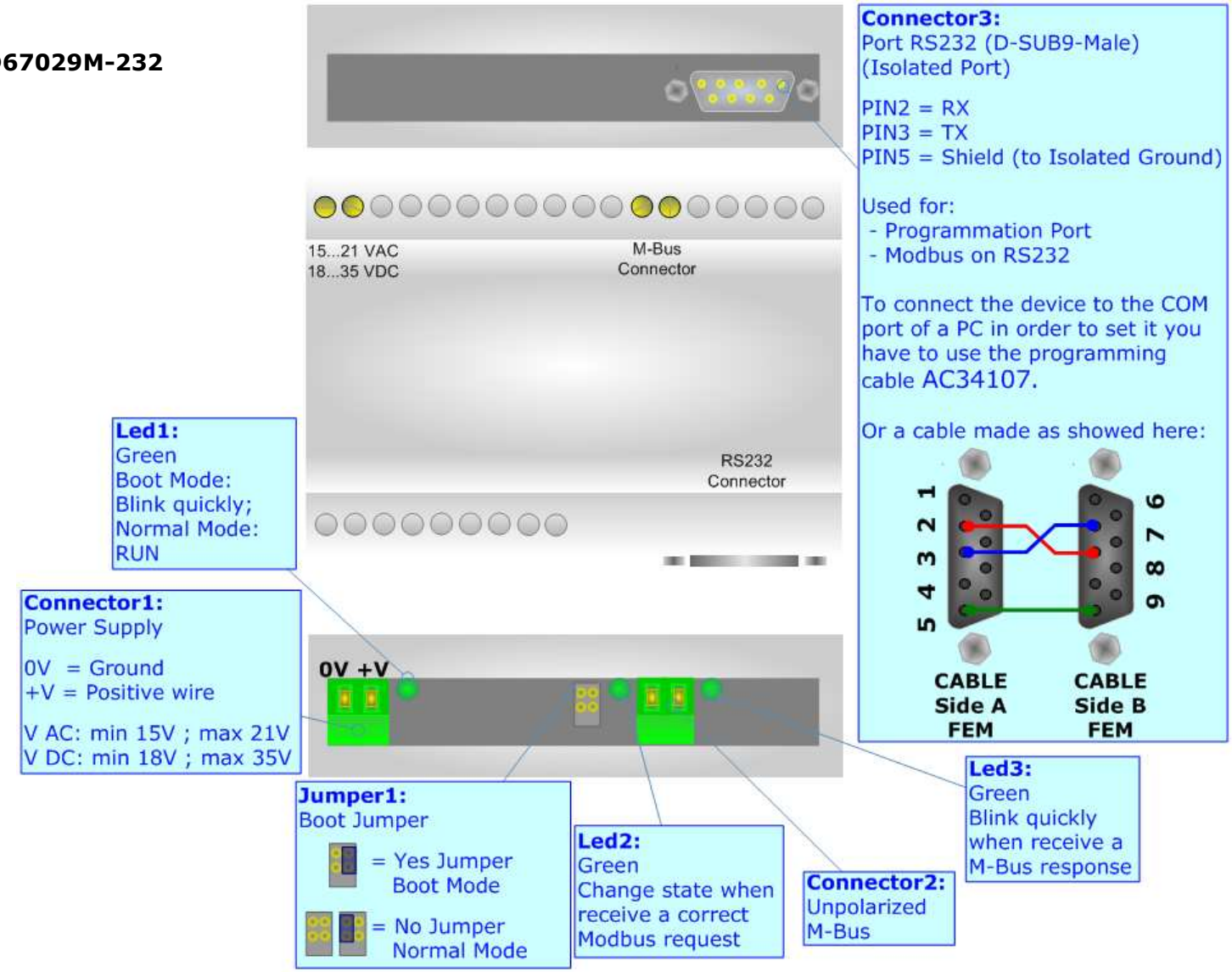


Figure 1: Connection scheme for HD67029M-232

Order Code: **HD67029M-485**

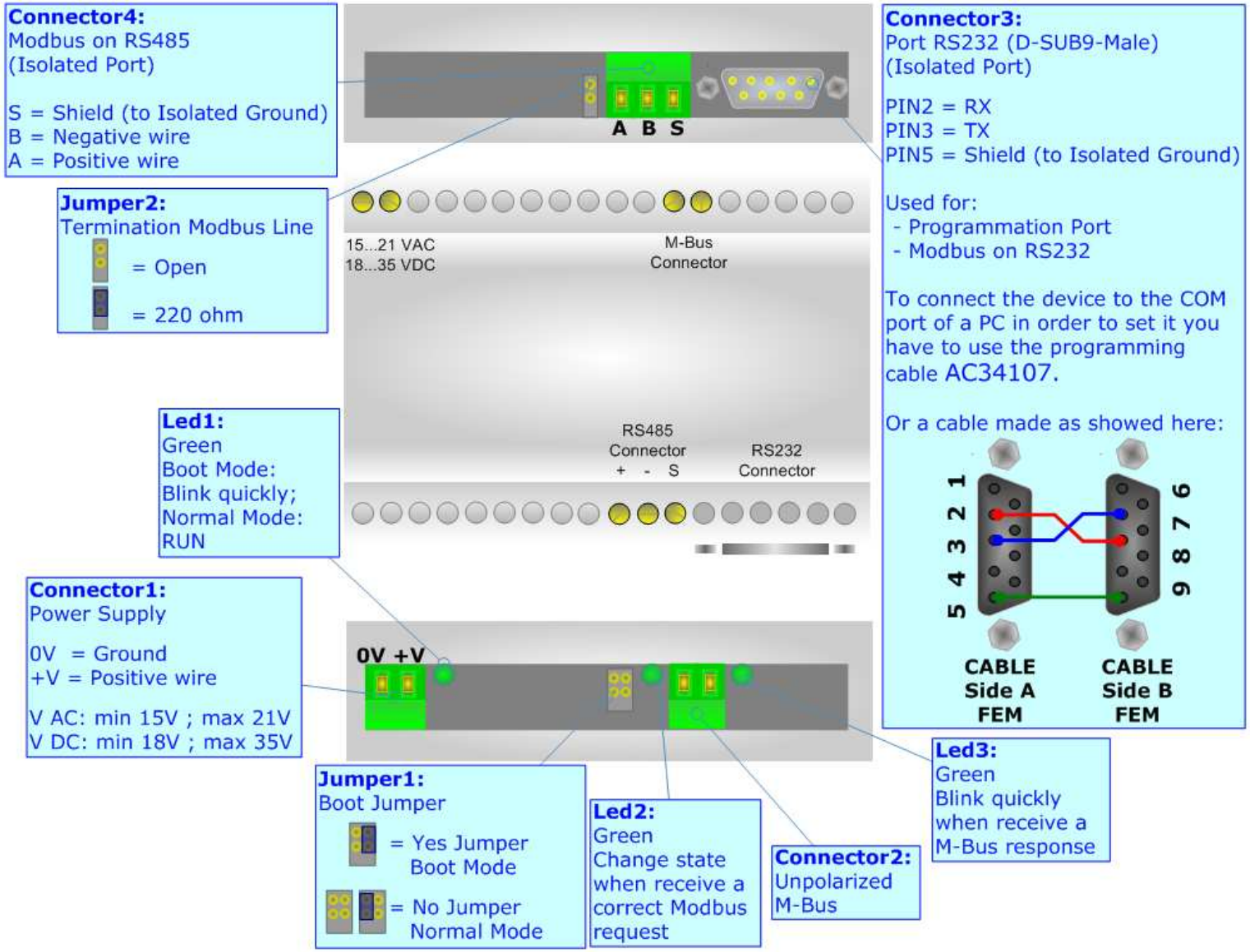


Figure 2: Connection scheme for HD67029M-485

Order Code: **HD67029M-232-40**
Order Code: **HD67029M-232-80**
Order Code: **HD67029M-232-160**
Order Code: **HD67029M-232-250**

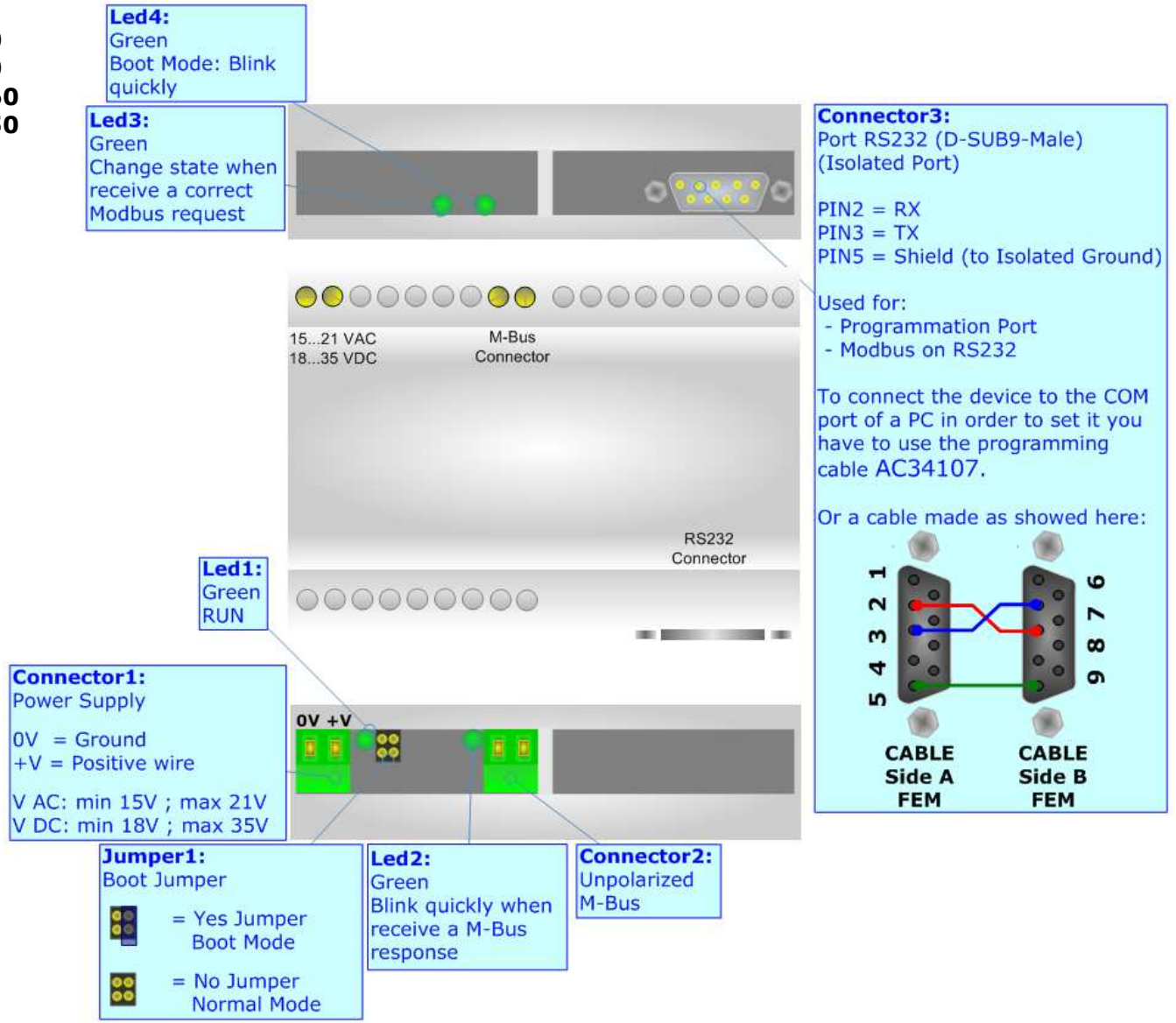


Figure 3: Connection scheme for HD67029M-232-xxx

Order Code: **HD67029M-485-40**
Order Code: **HD67029M-485-80**
Order Code: **HD67029M-485-160**
Order Code: **HD67029M-485-250**

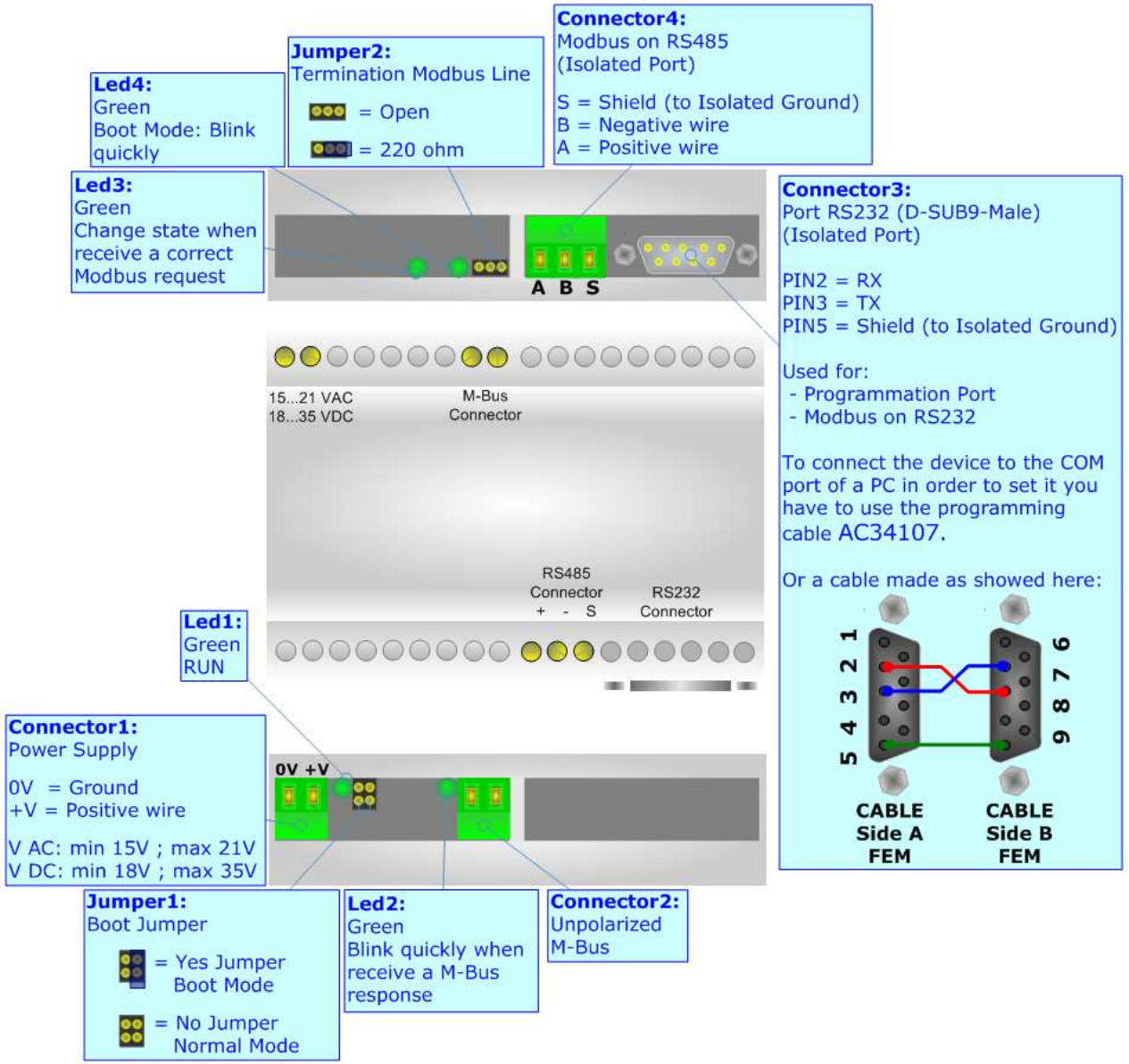


Figure 4: Connection scheme for HD67029M-485-xxx

CHARACTERISTICS:

The HD67029M-232-xxx / HD67029M-485-xxx is Gateway M-Bus to Modbus Slave line.

It allows the following characteristics:

- Electrical isolation between RS232C/RS485 and M-Bus;
- Baud Rate and Parity changeable with software;
- Mountable on Rail DIN;
- Power Supply 15…21V AC or 18…35V DC;
- Temperature range -30°C to 70°C.

At the Gateway can be connected up to 250 standard M-Bus devices. This number depends of the code expressed by the xxx number:

- HD67029M-232 or HD67029M-485 support up to 20 M-Bus devices;
- HD67029M-232-40 or HD67029M-485-40 support up to 40 M-Bus devices;
- HD67029M-232-80 or HD67029M-485-80 support up to 80 M-Bus devices;
- HD67029M-232-160 or HD67029M-485-160 support up to 160 M-Bus devices;
- HD67029M-232-250 or HD67029M-485-250 support up to 250 M-Bus devices.

In the case of HD67029M-232-160 and or HD67029M-485-160 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air.

In the case of HD67029M-232-250 and or HD67029M-485-250 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. These units have a fan in the top of the enclosure. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air. Take care to not cover the fan. It is recommended to put the device into a ventilated cabinet.

POWER SUPPLY:

The devices can be powered at 15…21V AC and 18…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

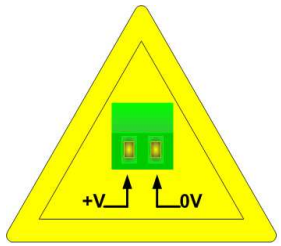
VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
15V	**21V**	**18V**	**35V**

Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67029M-232 / HD67029M-485	3.5	4
HD67029M-232-40 / HD67029M-485-40		5
HD67029M-232-80 / HD67029M-485-80		8
HD67029M-232-160 / HD67029M-485-160		14
HD67029M-232-250 / HD67029M-485-250		30

* This value is with all the Slave M-Bus devices of the code (20, 40, 80, 160, 250) connected to the line

Caution: Not reverse the polarity power



HD67029M-232-xxx HD67029M-485-xxx

SET COMMUNICATION PARAMETERS:

Configurable Parameters:

- Baud Rate of RS232/RS485 from 1200 to 115200 bps and of M-Bus from 300 to 38400 bps;
- Parity of RS232/RS485 and M-Bus with None/Odd/Even.

Fixed Parameters:

- 1 Bit Start;
- 8 Bit Data;
- 1 Bit Stop.

The Baud Rate and the Parity of RS232/RS485 and M-Bus are configurable with the software.

CONFIGURATION:

You need Compositor SW67029 software on your PC in order to perform the following:

- Define the parameter of Modbus line;
- Define the parameter of M-Bus line;
- Define which Modbus register contain the M-Bus information;
- Update the device.

FUNCTION MODES:

For the device HD67029M-232 and HD6702M-485 it is possible to update the microprocessor program. Therefore there are two functions to select from the boot jumper:

- NORMAL MODE (factory setting, without BOOT jumper): with this setting the HD67029M-232 or HD67029M-485 is able to function as an adapter M-Bus to Modbus on RS232/RS485;
- BOOT MODE (with BOOT jumper): the boot mode is activated when the HD67029M-232 or HD67029M-485 is turned on. Eventual program updates are available on the site www.adfweb.com

When the RUN Led blinks at frequency of about 1 second, the device functions in Normal Mode, otherwise if the run LED blinks more quickly the device is in Boot Mode.

USE OF COMPOSITOR SW67029 or SW67029_40_80_160_250:

To configure the Gateway, use the available software that runs with Windows, called SW67029 or SW67029_40_80_160_250. It is downloadable on the site www.adfweb.com and its operation is described in this document. *(This manual is referenced to the last version of the software present on our web site)*. The software works with MSWindows (MS 2000, XP, Vista, Seven).

When launching the SW67029 the right window appears (Fig. 5).

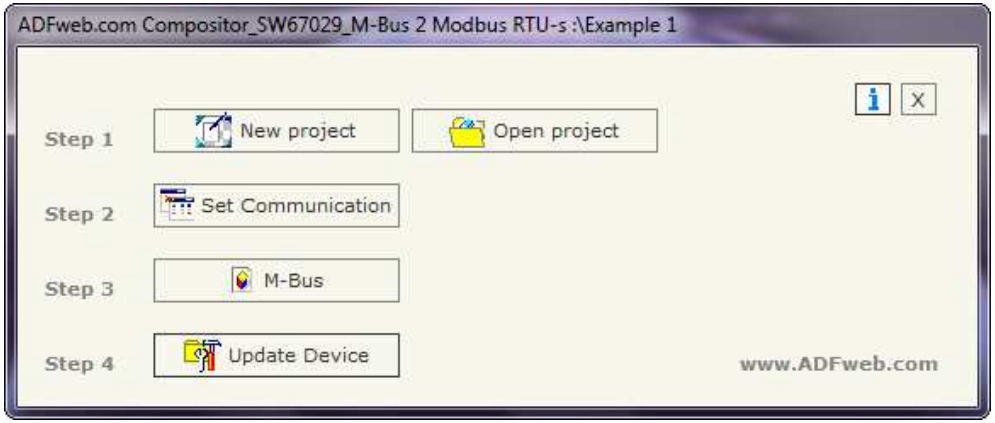


Figure 5: Main window for SW67029 and SW67029_40_80_160_250

NEW PROJECT / OPEN PROJECT:

The "**New Project**" button creates the folder which contains the entire device configuration.
A device configuration can also be imported or exported:

- To clone the configurations of a Programmable M-Bus to Modbus Gateway in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "**Open Project**";
- When a new project is created or an existent project is open, it will be possible to access the various sections of the software:
    - ***"Set Communication";***
    - ***"M-Bus";***
    - **"Update Device".**

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, Modbus and M-Bus.

By Pressing the "**Set Communication**" button from the main window for SW67029 (Fig. 5) the window "Set Communication" appears (Fig. 6).
The window is divided in two sections, one for the Modbus line (Serial) and the other for the M-Bus.

The means of the fields for Serial are:

- If the device is HD67029M-232, the field "**RS232**" must be checked, otherwise if is the HD67029M-485 it is possible to check the field "**RS232**" or "**RS485**";
- In the field "**Baudrate**" the baudrate of the serial line in use is defined;
- In the field "**Parity**" the parity of the serial line is defined;
- In the field "**ID Dev.**" the ID for the Modbus side is defined.
- In the subsection "Protocol" it is possible to select the protocol to use in Modbus line from the following:
  - **Modbus RTU**;
  - **Modbus ASCII**;
  - **JBUS**;
  - **Binary**: simple protocol defined by Us, whose functions are described in the document "Simple Protocol" downloadable at www.adfweb.com/download/filefold/Simple_Protocol_ENG.pdf;
  - **ASCII**: simple protocol defined by Us, whose functions are described in the document "Simple Protocol" downloadable at www.adfweb.com/download/filefold/Simple_Protocol_ENG.pdf.

The means of the fields for M-Bus are:

- In the field "**Baudrate**" the baudrate of the M-Bus net is defined;
- In the field "**Parity**" the parity of the M-Bus line is defined;
- If the field "**M-Bus Poll on request**" is checked, the Gateway makes the request only if a Modbus register is requested; otherwise if "**Cyclic request**" is checked, the Gateway makes the request in M-bus network each time the time defined under passes;
- In the field "**Delay**" insert a time expressed in seconds. This time is used for the "Cyclic request".

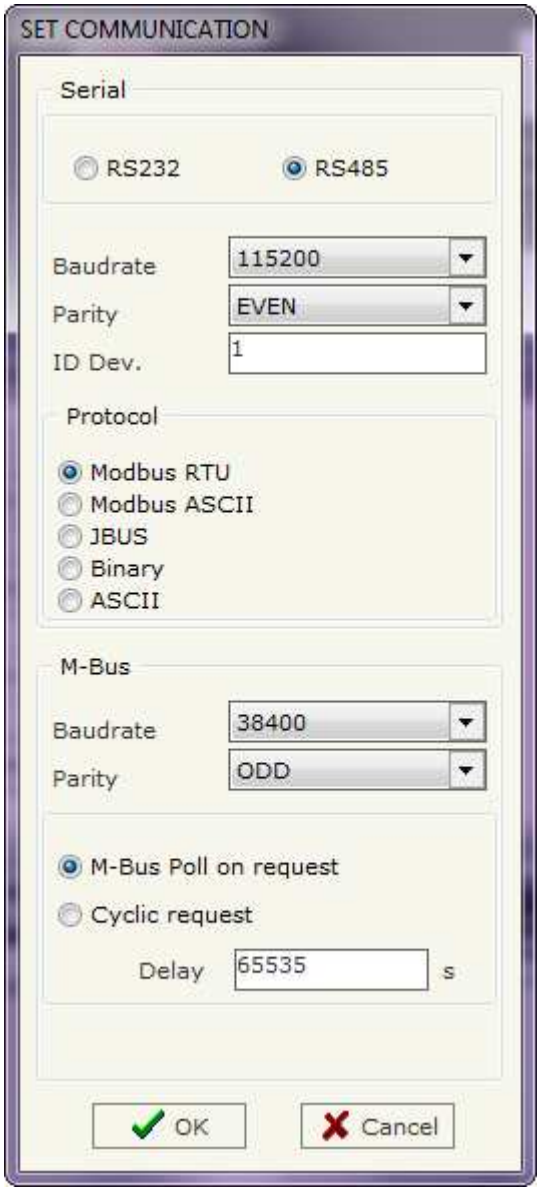


Figure 6: "Set Communication" window

M-BUS

By Pressing the "**M-Bus**" button from the main window for SW67029 (Fig. 5) the window "M-Bus Network" appears (Fig. 7).

SECTION NODES:

In the section "Nodes" it is possible to create the nodes of M-Bus line. In order to create a new node it is necessary to select which address use, selecting "**Primary ID**" or "**Secondary ID**", to makes the requests and then insert the "Primary Address" (from 1 to 250) or the Secondary Address" (from 0 to 99999999) of M-Bus device in the field "**ID Node M-Bus**". In the field "**Description**" it is possible to write a short description of the node.
In the field "**Node State**" it is possible to insert an address Modbus that contain the Status of the M-Bus device. If you don't need to know this, put this register at 0.
In the field "**Identification Number**" it is possible to insert an address Modbus that contain the Identification Number of the M-Bus device. You have to read two consecutive registers for knowing the value. If you don't need to know this, put this register at 0.
If the field "**Convert BCD in Integer Identification Num.**" is checked the gateway converts the Identification Number that is normally expressed in BCD in a Integer.
In the field "**Swap Identification Num.**" it is possible to select the swap mode of the Identification Number. If swap isn't necessary you have to select "None"; otherwise see the section "Swap Identification" (page 21) of this document for select the swap mode.
If the field "**Send SND_NKE**" is checked, the Gateway send the "SND_NKE" frame to start the communication.
In the field "**Send Reset App.**" Is checked the gateway send the "Application Reset" command to the slave. In the field "**Variables List**" it is possible to select which type of variables definition to use.
If is selected "By Type" it is necessary to fill all fields, in the section Variables, with the correct values; otherwise if "By Position" is selected you can insert the progressive number of the variable that you need (page 15-16 for more information).

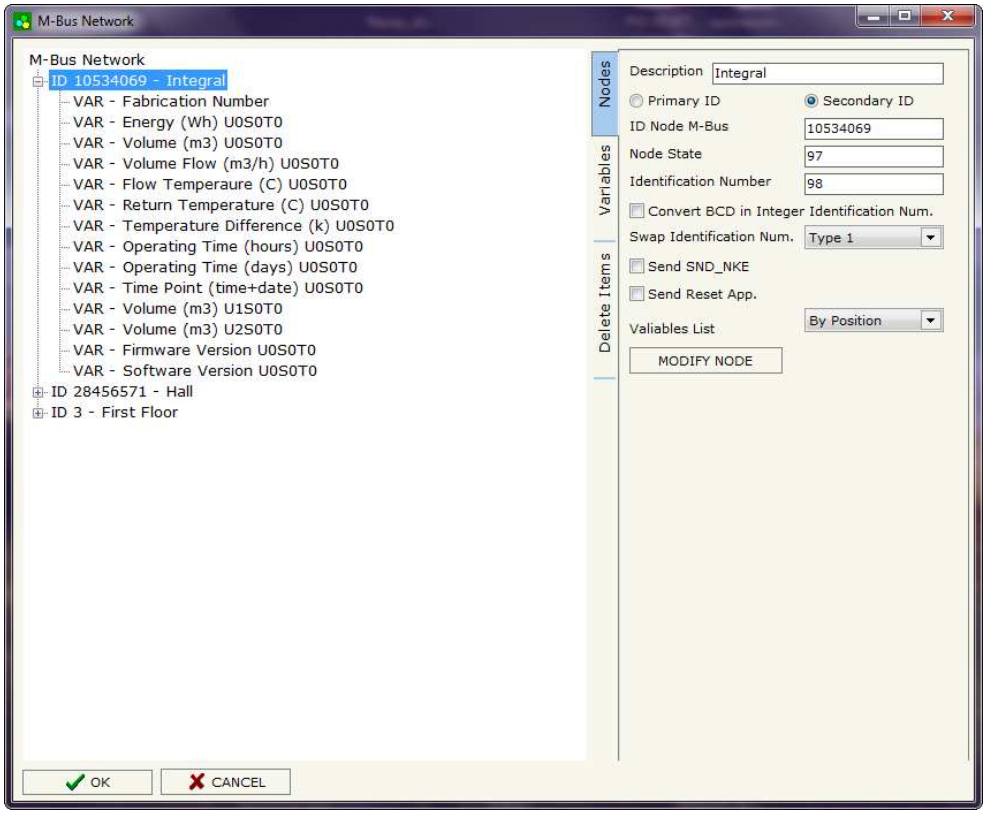
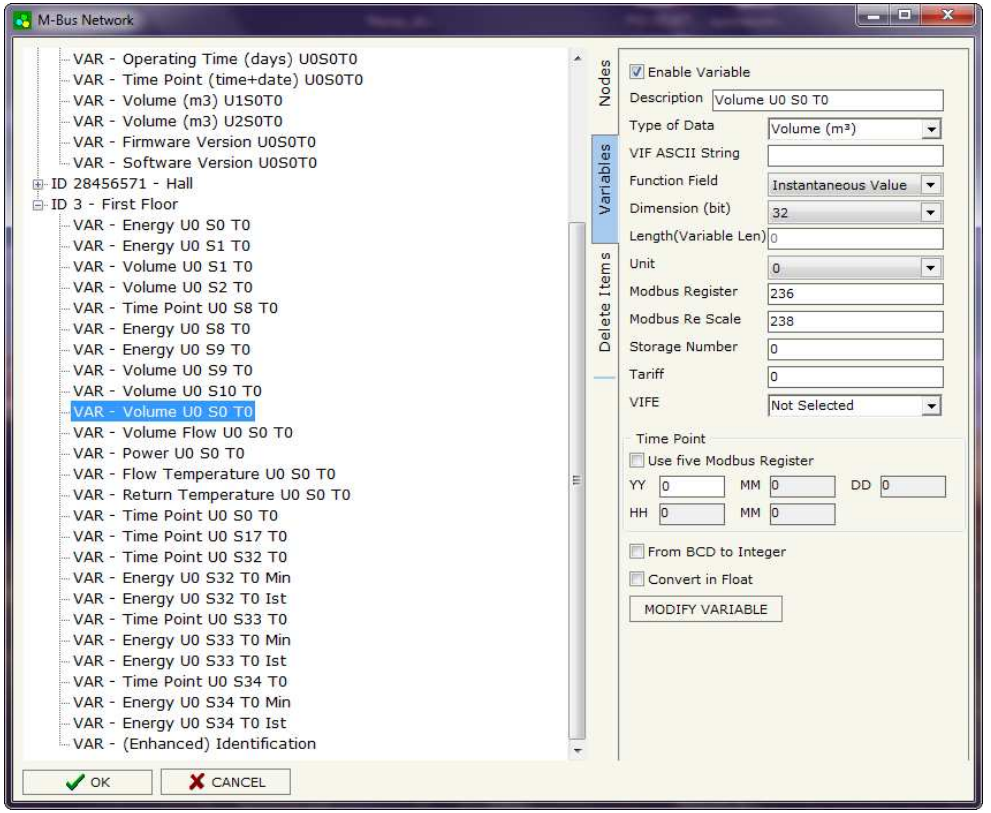


Figure 7: "M-Bus Network" window

After that, pressing the "**ADD NODE**" button, a new node appears in the left side of the window. In order to modify a created node it is necessary to select the desired node, change the wrong items and then press the "**MODIFY NODE**" button.

SECTION VARIABLES (BY TYPE):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:



- To use the created variable the field "**Enable Variable**" must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field "**Description**" it is possible to write a description of the variable (it isn't a necessary information,
- it helps the readability of the tree of network);
- The field "**Type of Data**" is used to select the unit of measure;
- In the field "**VIF ASCII String**" insert the string of VIF. It is possible to use this field only if the "Type of Data" is "VIF is in ASCII";
- In the field "**Function Field**" it is necessary to select the type of data;
- The field "**Dimension**" is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field "**Length(Variable Len)**" insert the length of the data in the case of the dimension is "Variable Length";
- In the field "**Unit**" if it is necessary it is possible to select the unit of that variable. The Unit is used for indicates from which device the data come;
- In the field "**Modbus Register**" it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";
- In the field "**Modbus Re Scale**" it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";
- In the field "**Storage Number**" if it is necessary it is possible to insert the value of storage counter of that variable. With this field the slave can indicate and transmit various stored counter states or historical values, in the order in which they occur;
- In the field "**Tariff**" if it is necessary it is possible to insert the value of the tariff of that variable. The Tariff is used for indicates from which device the data come;
- In the field "**VIFE**" it is possible to select a sub-type of "Type of Data";

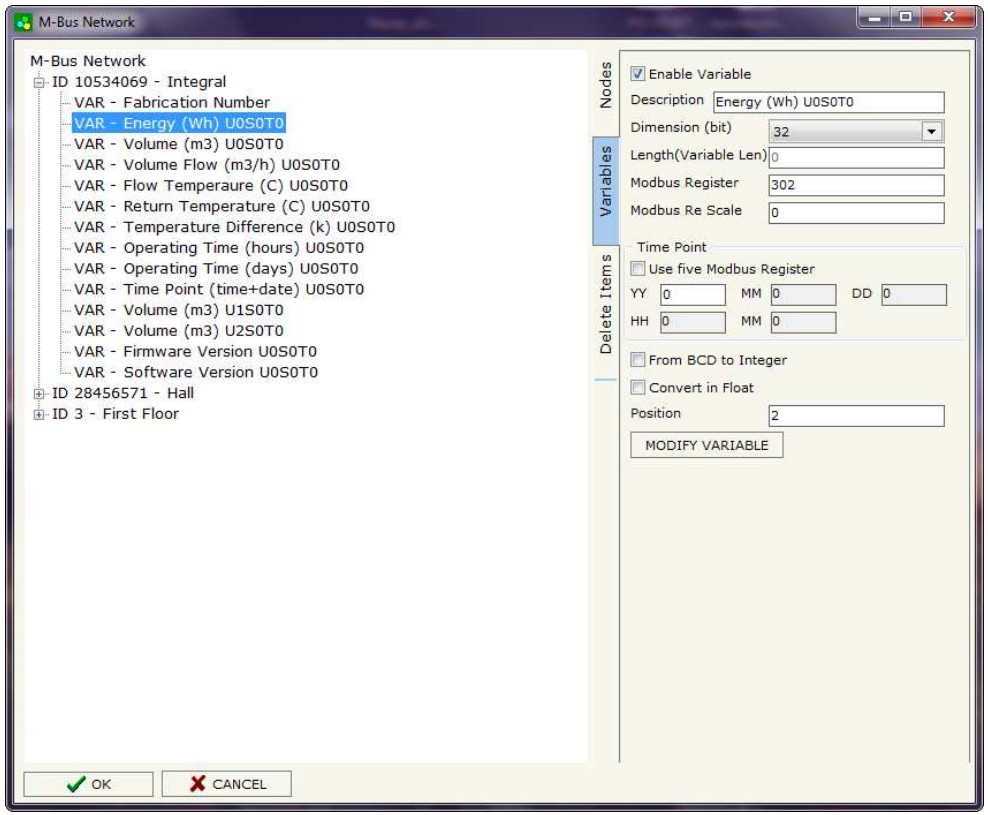
- If the field "**Use Five Modbus Register**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure). You have to insert the first Modbus Register.
- If the field "**From BCD to Integer**" is checked the Gateway converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes.
- If the field "**Convert in Float**" is checked the Gateway converts the data into Float type. Every variable occupies two consecutive Modbus Registers and the first one is the one defined in "Modbus Register". In this case the float value is multiplied by the "Modbus Re Scale" automatically.

Having completed this fields, to add the variable the button "**ADD VARIABLE**" must be pressed.

In order to modify a created variable it is necessary to select the desired variable, change the wrong items and then press the "**MODIFY VARIABLE**" button.

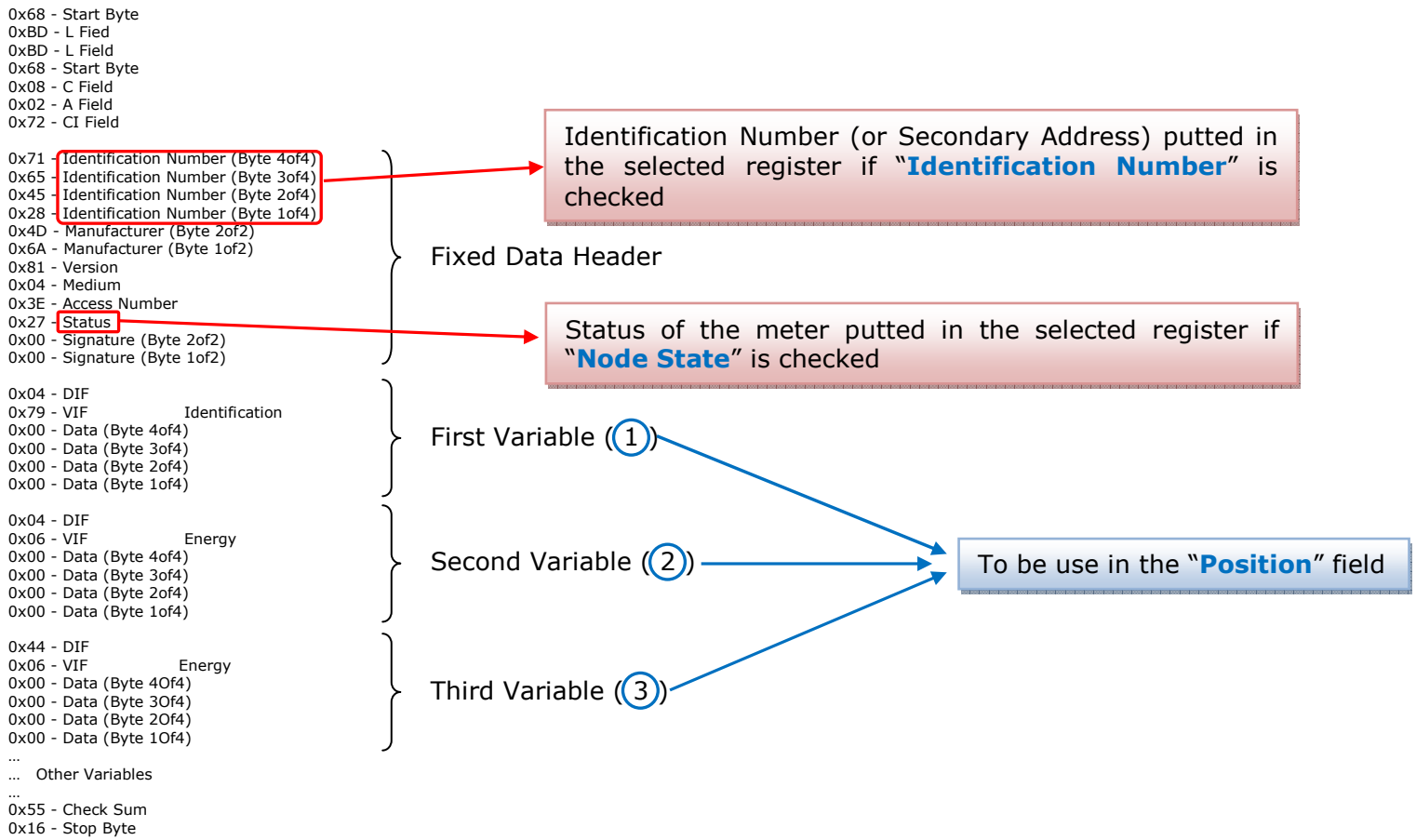
SECTION VARIABLES (BY POSITION):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:



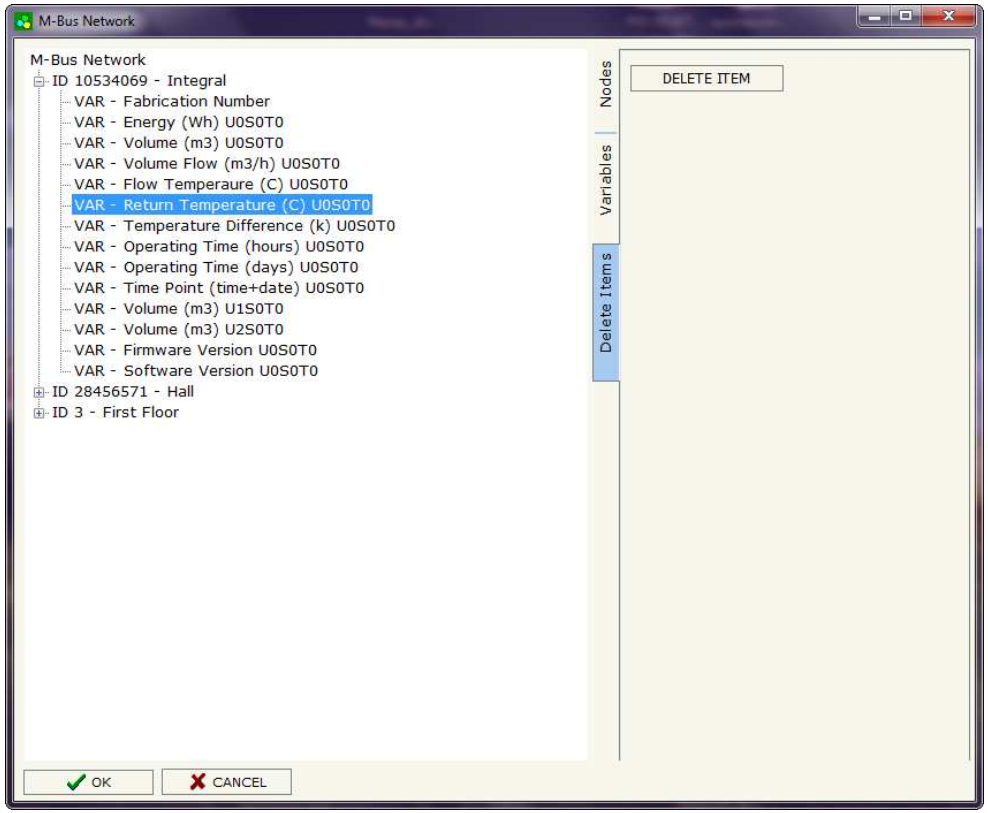
- To use the created variable the field "**Enable Variable**" must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field "**Description**" it is possible to write a description of the variable (it isn't a necessary information, it helps the readability of the tree of network);
- The field "**Dimension**" is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field "***Length(Variable Len)***" insert the length of the data in the case of the dimension is "Variable Length";
- In the field "**Modbus Register**" it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";
- In the field "**Modbus Re Scale**" it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";
- If the field "**Use Five Modbus Register**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure (page 22 for more information)). You have to insert the first Modbus Register.
- If the field "**From BCD to Integer**" is checked the Gateway converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes;
- If the field "**SWAP**" is checked the byte of data of that variable are swapped. Example: from 0x01020304 to 0x04030201;
- In the field "**Position**" insert the number of the variable that you want on Modbus.

Example:


0x68 - Start Byte
0xBD - L Fied
0xBD - L Field
0x68 - Start Byte
0x08 - C Field
0x02 - A Field
0x72 - CI Field
0x71 - Identification Number (Byte 4of4)
0x65 - Identification Number (Byte 3of4)
0x45 - Identification Number (Byte 2of4)
0x28 - Identification Number (Byte 1of4)
0x4D - Manufacturer (Byte 2of2)
0x6A - Manufacturer (Byte 1of2)
0x81 - Version
0x04 - Medium
0x3E - Access Number
0x27 - Status
0x00 - Signature (Byte 2of2)
0x00 - Signature (Byte 1of2)
Identification Number (or Secondary Address) putted in the selected register if "Identification Number" is checked
Fixed Data Header
Status of the meter putted in the selected register if "Node State" is checked
0x04 - DIF
0x79 - VIF Identification
0x00 - Data (Byte 4of4)
0x00 - Data (Byte 3of4)
0x00 - Data (Byte 2of4)
0x00 - Data (Byte 1of4)
First Variable (1)
0x04 - DIF
0x06 - VIF Energy
0x00 - Data (Byte 4of4)
0x00 - Data (Byte 3of4)
0x00 - Data (Byte 2of4)
0x00 - Data (Byte 1of4)
Second Variable (2)
0x44 - DIF
0x06 - VIF Energy
0x00 - Data (Byte 4Of4)
0x00 - Data (Byte 3Of4)
0x00 - Data (Byte 2Of4)
0x00 - Data (Byte 1Of4)
Third Variable (3)
To be use in the "Position" field
...
... Other Variables
...
0x55 - Check Sum
0x16 - Stop Byte

SECTION DELETE ITEMS:

If it is necessary to delete a node or a variable, you have to select the node or the variable and then press the "**DELETE ITEM**" button.


M-Bus Network
M-Bus Network
ID 10534069 - Integral
VAR - Fabrication Number
VAR - Energy (Wh) U0S0T0
VAR - Volume (m3) U0S0T0
VAR - Volume Flow (m3/h) U0S0T0
VAR - Flow Temperaure (C) U0S0T0
VAR - Return Temperature (C) U0S0T0
VAR - Temperature Difference (k) U0S0T0
VAR - Operating Time (hours) U0S0T0
VAR - Operating Time (days) U0S0T0
VAR - Time Point (time+date) U0S0T0
VAR - Volume (m3) U1S0T0
VAR - Volume (m3) U2S0T0
VAR - Firmware Version U0S0T0
VAR - Software Version U0S0T0
ID 28456571 - Hall
ID 3 - First Floor
Nodes
Variables
Delete Items
DELETE ITEM
OK
CANCEL

Possible choices for the fields used to create a variable:

Type of Data:
|_Energy (Wh)
|_Energy (J)
|_Volume (m^3)
|_Mass (Kg)
|_On Time
|_Operating Time
|_Power (W)
|_Power (J/h)
|_Volume Flow (m^3/h)
|_Volume Flow Ext. (m^3/min)
|_Volume Flow Ext. (m^3/s)
|_Mass Flow (Kg/h)
|_Flow Temperature (°C)
|_Return Temperature (°C)
|_Temperature Difference (K)
|_External Temperature (°C)
|_Pressure (bar)
|_Averaging Duration
|_Actuality Duration
|_Type of data in VIFE
|_Time Point
|_VIF is in ASCII
|_Unit for H.C.A.
|_Fabrication No
|_(Enhaced) Identification
|_Bus Address

Function Field:
|_Instantaneous Value
|_Minimum Value
|_Maximum Value
|_Value During Error State

Dimension (bit):
|_8
|_16
|_24
|_32
|_32 real
|_48
|_64
|_Variable Length

VIFE:

|_ Not Selected
|_ Credit of the nominal local legal currency units
|_ Debit of the nominal local legal currency units
|_ Access Number (transmission count)
|_ Medium (as in fixed header)
|_ Manufacturer (as in fixed header)
|_ Parameter set identification
|_ Model/Version
|_ Hardware Version #
|_ Firmware Version #
|_ Software Version #
|_ Customer Location
|_ Customer
|_ Access Code User
|_ Access Code Operator
|_ Access Code System Operator
|_ Access Code Developer
|_ Password
|_ Error flags (binary)
|_ Error mask
|_ Digital Output (binary)
|_ Digital Input (binary)
|_ Baudrate [Baud]
|_ response delay time [bittimes]
|_ Retry
|_ First storage # for cyclic storage
|_ Last storage # for cyclic storage
|_ Size of storage block
|_ Storage interval [sec(s)..day(s)]
|_ Storage interval month(s)
|_ Storage interval year(s)
|_ Duration since last readout[sec(s)..day(s)]
|_ Start (date/time) of tariff
|_ Duration of tariff (nn=01..11:min to day)
|_ Period of tariff [sec(s) to day(s)]
|_ Period of tariff months(s)
|_ Period of tariff year(s)
|_ dimensionless/ no VIF
|_ Volts
|_ Ampere
|_ Reset counter
|_ Comulation counter
|_ Control signal
|_ Day of week
|_ Week number
|_ Time point of day change
|_ State of parameter activation
|_ Special supplier information
|_ Duration since last comulation [hour(s)..year(s)]
|_ Operation time battery [hour(s)..year(s)]
|_ Date and time of battery change
|_ Energy MWh
|_ Energy GJ
|_ Volume
|_ Mass
|_ Volume 0,1 feet^3
|_ Volume 0,1 american gallon
|_ Volume 1 american gallon
|_ Volume flow 0,001 american gallon/min
|_ Volume flow 1 american gallon/min
|_ Volume flow 1 american gallon/h
|_ Power MW
|_ Power GJ/h
|_ Flow Temperature
|_ Return Temperature
|_ Temperature Difference
|_ External Temperature
|_ Cold/Warm Temperature Limit °F
|_ Cold/Worm Temperature Limit °C
|_ Cumul. count max power

|_ per second
|_ per minute
|_ per hour
|_ per day
|_ per week
|_ per month
|_ per year
|_ per revolution/measurement
|_ increment per input pulse on input channel
|_ increment per output pulse on output channel
|_ per liter
|_ per m^3
|_ per kg
|_ per K (Kelvin)
|_ per kWh
|_ per GJ
|_ per kW
|_ per (K*l)(Kelvin*liter)
|_ per V (Volt)
|_ per A (Ampere)
|_ multiplied by sek
|_ multiplied by sek/V
|_ multiplied by sek/A
|_ start date(/time) of
|_ VIF contains uncorrected unit instead of corrected unit
|_ Accumulation only if positive contributions
|_ Accumulation of abs value only if negative contributions
|_ upper/lower limit value
|_ # of exceeds of lower/upper limit
|_ Date(/time) of begin/end of first/last lower/upper limit exceed
|_ Duration of limit exceed
|_ Duration of first/last
|_ Date(/time) of first/last begin/end
|_ Multiplicative currection factor
|_ Additive correction constant * unit of VIF (offset)
|_ Moltiplicative correction factor: 10^3
|_ future value
|_ next VIFE's and data of this block are manufacturer specific
|_ None
|_ Too many DIFE's
|_ Storage number not implemented
|_ Unit number not implemented
|_ Tariff number not implemented
|_ Function not implemented
|_ Data class not implemented
|_ Data size not implemented
|_ Too many VIFE's
|_ Illegal VIF-Group
|_ Illegal VIF-Exponent
|_ VIF/DIF mismatch
|_ Unimplemented action
|_ No data available (undefined value)
|_ Data overflow
|_ Data underflow
|_ Data error
|_ Premature end of record

Swap Identification:

This field is used for select the Swap mode of Identification Number.

At the moment there are these possibilities:

- None;
- Type 1.

Examples:

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. not checked.

None	Type 1
1000: 0x1234	1000: 0x5678
1001: 0x5678	1001: 0x1234

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. checked.

None	Type 1
1000: 0x00BC	1000: 0x614E
1001: 0x614E	1001: 0x00BC

To know the meaning of value read in the "Modbus Re Scale" field, you must follow this table (x = Value read in Modbus Re Scale):

Description	Range Coding	Range
Energy	$10^{(x-3)}$ Wh	0.001 Wh to 10000 Wh
Energy	$10^{(x)}$ J	0.001 kJ to 10000 kJ
Volume	$10^{(x-6)}$ m^3	0.001 l to 10000 l
Mass	$10^{(x-3)}$ kg	0.001 kg to 10000 kg
On Time	x = 0 Seconds x = 1 Minutes x = 2 Hours x = 3 Days	
Operating Time	coded like On Time	
Power	$10^{(x-3)}$ W	0.001 W to 10000 W
Power	$10^{(x)}$ J/h	0.001 kJ/h to 10000 kJ/h
Volume Flow	$10^{(x-6)}$ m^3/h	0.001 l/h to 10000 l/h
Volume Flow Ext.	$10^{(x-7)}$ m^3/min	0.0001 l/min to 1000 l/min
Volume Flow Ext.	$10^{(x-9)}$ m^3/s	0.001 ml/s to 10000 ml/s
Mass Flow	$10^{(x-3)}$ kg/h	0.001 kg/h to 10000 kg/h
Flow Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Return Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Temperature Difference	$10^{(x-3)}$ K	1 mK to 1000 mK
External Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Pressure	$10^{(x-3)}$ bar	1 mbar to 1000 mbar
Averaging Duration	coded like On Time	
Actuality Duration	coded like On Time	
Time Point	x = 0 Date x = 1 Time&Date	Data type G Data type F
Unit for H.C.A.		dimensionless

Data type F:

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	21^0	2^9	2^8
2^{23}	2^{22}	2^{21}	22^0	2^{19}	2^{18}	2^{17}	2^{16}
2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}

Min (0 ... 59);
Hour (0 ... 23);
Day (1 ... 31);
Month (1 ... 12);
Year (0 ... 99);
Time Invalid (0=Valid, 1=Invalid);
Summer Time (0=Standard Time, 1=Summer Time);
Reserved (0).

Data type G:

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	21^0	2^9	2^8

Day (1 ... 31);
Month (1 ... 12);
Year (0 ... 99).

For example, if you have defined:

- Type of Data= Energy (J);
- Function Field=Instantaneous Value;
- Dimension= 32 bit;
- Modbus Register=150 (Register 151 declared implicitly because the dimension is 32 bit);
- Modbus Re Scale=152.

After the request, in Modbus register 150 you read 0x0004, in 151 you read 0x5678 and in register 152 is write 0x0006. The value obtained is: 284280 $x10^{(6)}$ J.

UPDATE DEVICE:

By pressing the "**Update Device**" button it is possible to load the created Configuration into the device; and also the Firmware, if is necessary.

In order to load the parameters or update the firmware in the gateway, follow these instructions:

- Turn off the Device;
- Connect the Null Modem Cable form your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 1,2,3,4);
- Select the COM port and press the "**Connect**" button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (For more info see Fig. 1,2,3,4);
- Press the "**Next**" button;
- Select which operations you want to do. You can select only "Firmware", only "Project" or both of them;
- Press the "**Execute update firmware**" button to start the upload;
- When all the operations are "OK" turn off the device;
- Disconnect the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

At this point the configuration/firmware on the device is correctly update.

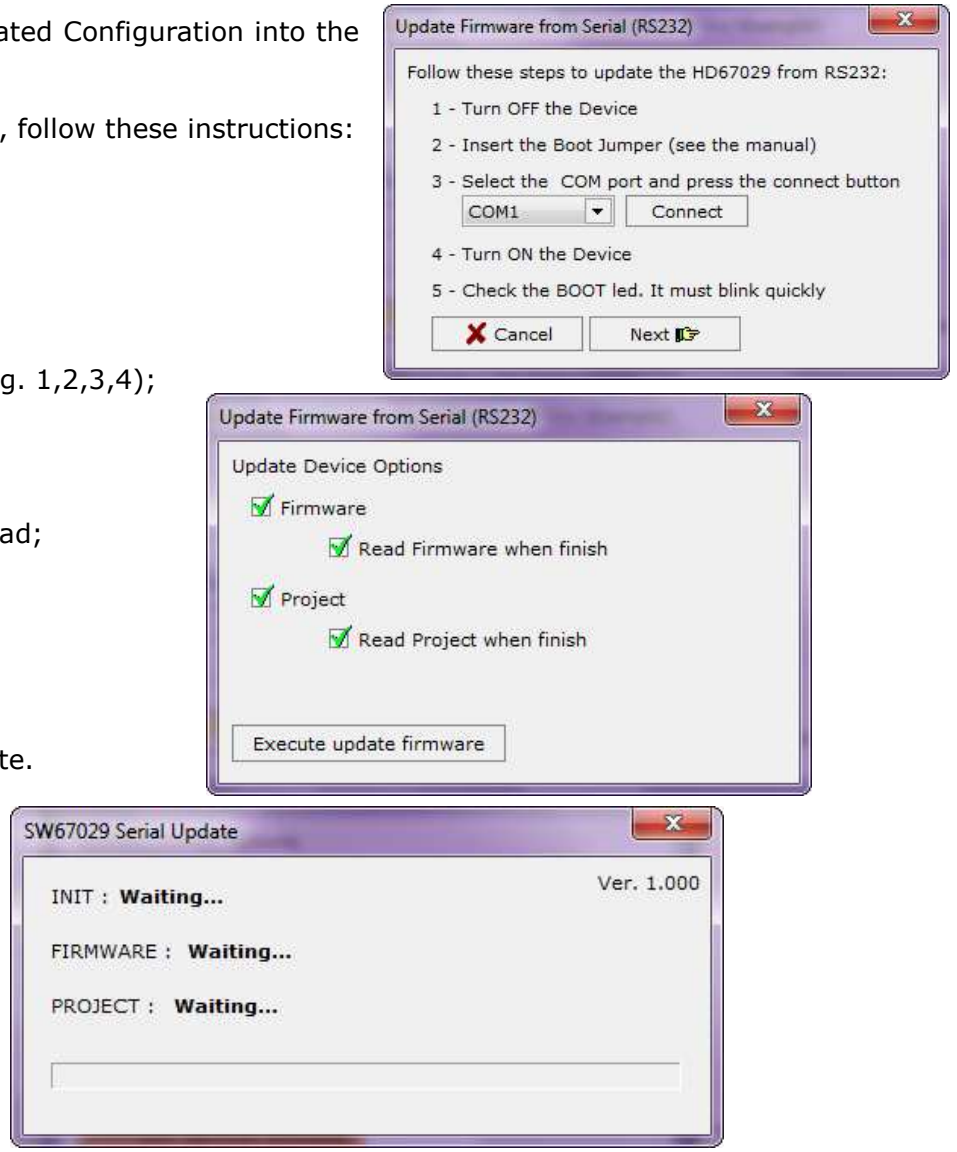

Update Firmware from Serial (RS232)
Follow these steps to update the HD67029 from RS232:
1 - Turn OFF the Device
2 - Insert the Boot Jumper (see the manual)
3 - Select the COM port and press the connect button
COM1
Connect
4 - Turn ON the Device
5 - Check the BOOT led. It must blink quickly
Cancel
Next
Update Firmware from Serial (RS232)
Update Device Options
Firmware
Read Firmware when finish
Project
Read Project when finish
Execute update firmware
SW67029 Serial Update
Ver. 1.000
INIT : Waiting...
FIRMWARE : Waiting...
PROJECT : Waiting...

Figure 8: "Update Device" windows

Note:
When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67029M-232-xxx or HD67029M-485-xxx device.

Warning:
If the Fig. 9 appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System.

Figure 9: "Protection" window

In the case of HD67029M-232 you have to use the software "SW67029": www.adfweb.com/download/filefold/SW67029.zip.

In the case of HD67029M-232-40, HD67029M-232-80, HD67029M-232-160, HD67029M-232-250 you have to use the software "SW67029 40 80 160 250": www.adfweb.com/download/filefold/SW67029_40_80_160_250.zip.

In the case of HD67029M-485 you have to use the software "SW67029": www.adfweb.com/download/filefold/SW67029.zip.

In the case of HD67029M-485-40, HD67029M-485-80, HD67029M-485-160, HD67029M-485-250 you have to use the software "SW67029 40 80 160 250": www.adfweb.com/download/filefold/SW67029_40_80_160_250.zip.

CHARACTERISTICS OF THE CABLE:

Rs232:

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a NULL MODEM cable (a serial cable where the pins 2 and 3 are crossed).
It is recommended that the RS232C Cable not exceed 15 meters.

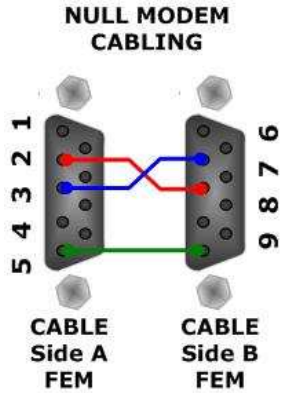


Figure 10: Null modem cabling

M-Bus:

A two wire standard telephone cable (JYStY N*2*0.8 mm) is used as the transmission medium for the M-Bus. The maximum distance between a slave and the repeater is 350m; this length corresponds to a cable resistance of up 29Ω. This distance applies for the standard configuration having Baud rates between 300 and 9600 Baud, and a maximum of 250 slaves. The maximum distance can be increased by limiting the Baud rate and using fewer slaves, but the bus voltage in the space state must at no point in a segment fall below 12V, because of the remote powering of the slaves. In the standard configuration the total cable length should not exceed 1000m, in order to meet the requirement of a maximum cable capacitance of 180nF. *(Taken from M-Bus specifics)*

MECHANICAL DIMENSIONS:

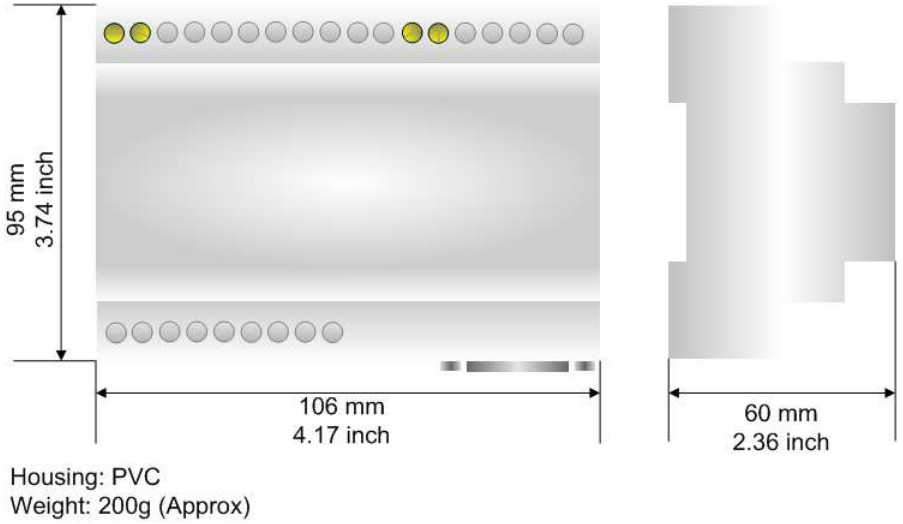


Figure 11: Mechanical dimensions scheme for HD67029M-232

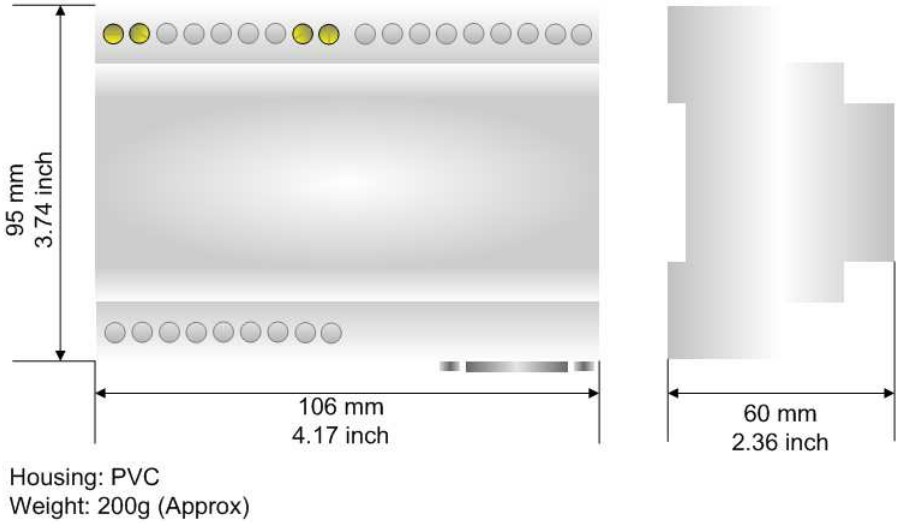


Figure 12: Mechanical dimensions scheme for HD67029M-232-40, HD67029M-485-80

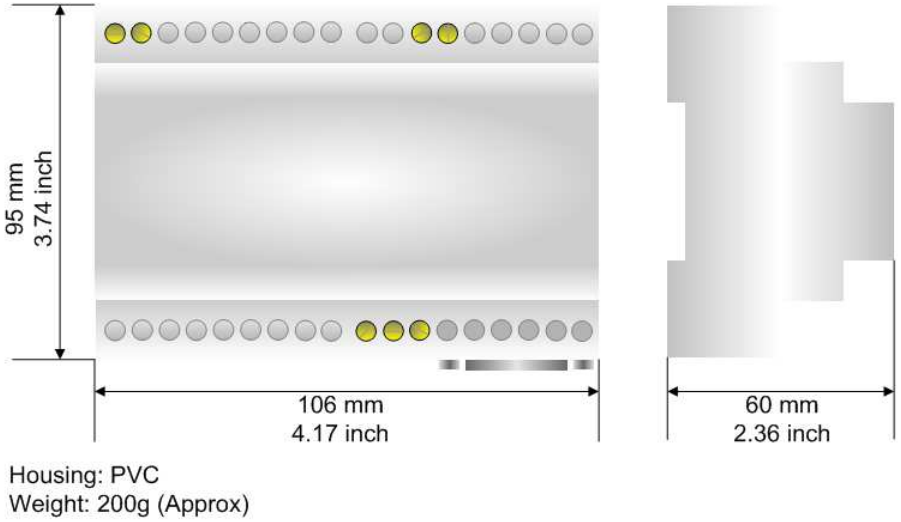


Figure 13: Mechanical dimensions scheme for HD67029M-485

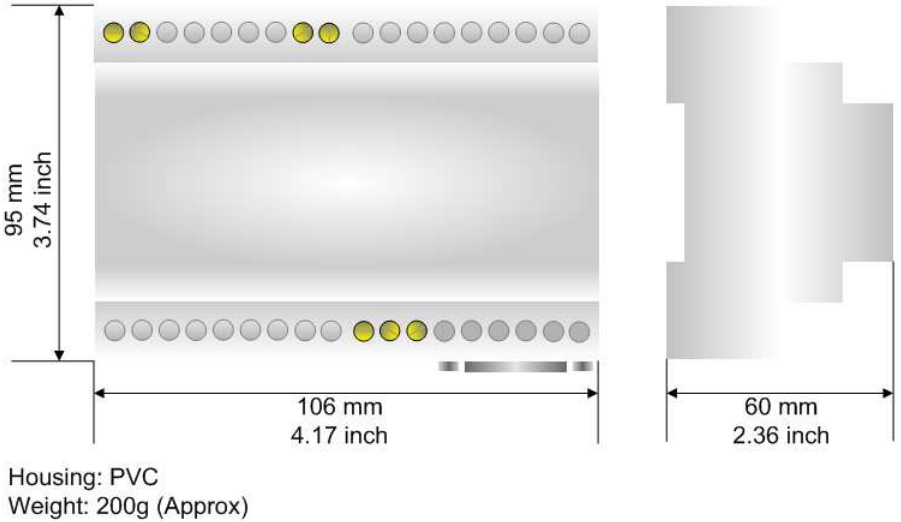


Figure 14: Mechanical dimensions scheme for HD67029M-485-40, HD67029M-485-80

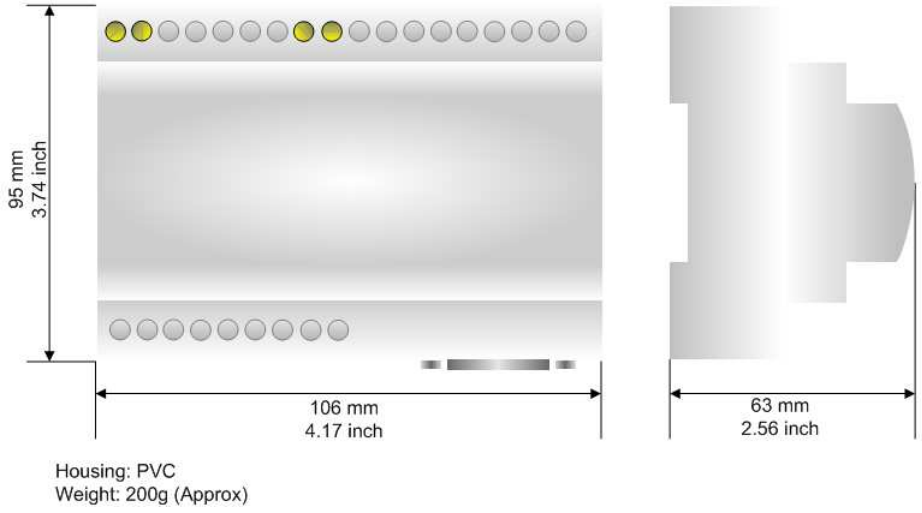


Figure 15: Mechanical dimensions scheme for HD67029M-232-160

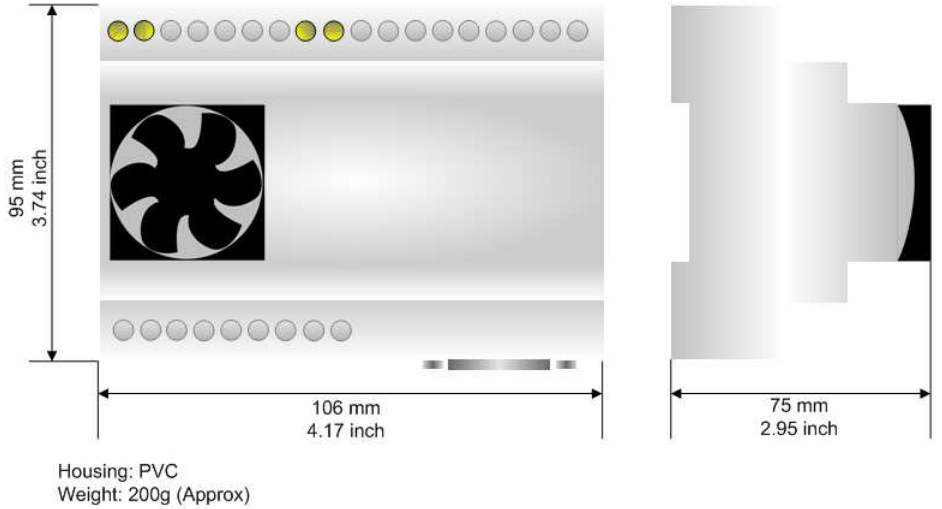


Figure 16: Mechanical dimensions scheme for HD67029M-232-250

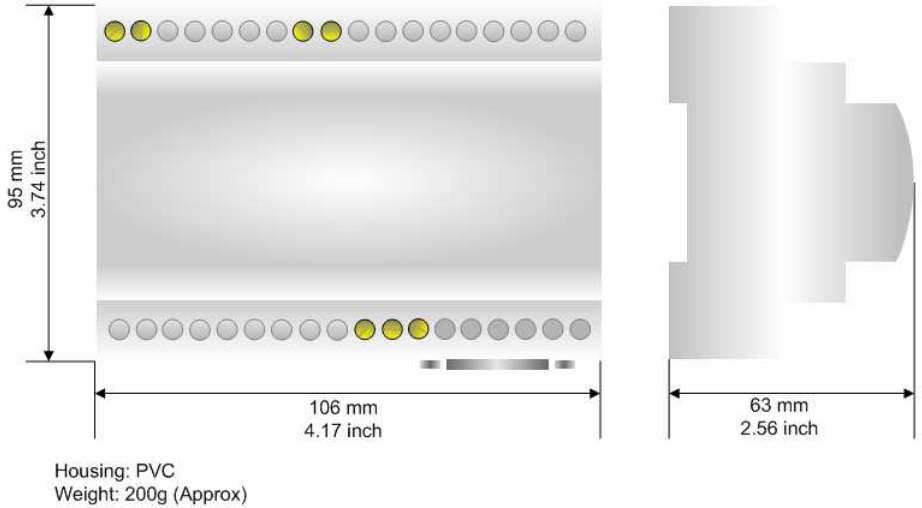


Figure 17: Mechanical dimensions scheme for HD67029M-485-160

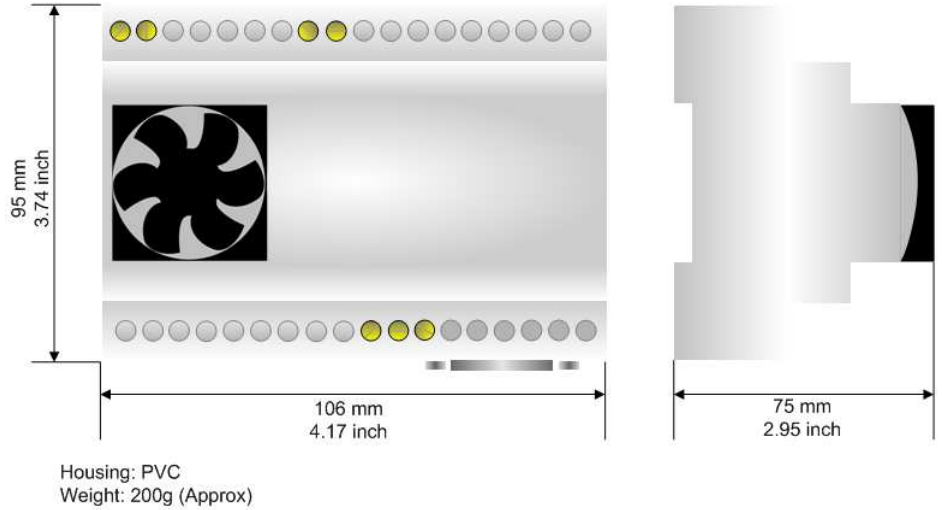


Figure 18: Mechanical dimensions scheme for HD67029M-485-250

ORDERING INFORMATIONS:

The ordering part number is formed by a valid combination of the following:

HD67029M – xxx – yyy

Maximum number of slaves supported
20: up to 40 standard slaves (1.5mA consumption) connected to M-Bus
40: up to 40 standard slaves (1.5mA consumption) connected to M-Bus
80: up to 80 standard slaves (1.5mA consumption) connected to M-Bus
160: up to 160 standard slaves (1.5mA consumption) connected to M-Bus
250: up to 250 standard slaves (1.5mA consumption) connected to M-Bus

Modbus Communication Port
232: Modbus over RS232
485: Modbus over RS485 and RS232

Enclosure / Connectors Type
M: Modulbox 4M DIN Rail mounting / Fixed Screw Terminal

Device Family
HD67029: Gateway M-Bus Master from/to Modbus Slave

Order Code:	**HD67029M-232-20**	**-**	Gateway M-Bus to Modbus on RS232 (up to 20 slaves connected to M-Bus)
Order Code:	**HD67029M-232-40**	**-**	Gateway M-Bus to Modbus on RS232 (up to 40 slaves connected to M-Bus)
Order Code:	**HD67029M-232-80**	**-**	Gateway M-Bus to Modbus on RS232 (up to 80 slaves connected to M-Bus)
Order Code:	**HD67029M-232-160**	**-**	Gateway M-Bus to Modbus on RS232 (up to 160 slaves connected to M-Bus)
Order Code:	**HD67029M-232-250**	**-**	Gateway M-Bus to Modbus on RS232 (up to 250 slaves connected to M-Bus)
Order Code:	**HD67029M-485-20**	**-**	Gateway M-Bus to Modbus on RS485 (up to 20 slaves connected to M-Bus)
Order Code:	**HD67029M-485-40**	**-**	Gateway M-Bus to Modbus on RS485 (up to 40 slaves connected to M-Bus)
Order Code:	**HD67029M-485-80**	**-**	Gateway M-Bus to Modbus on RS485 (up to 80 slaves connected to M-Bus)
Order Code:	**HD67029M-485-160**	**-**	Gateway M-Bus to Modbus on RS485 (up to 160 slaves connected to M-Bus)
Order Code:	**HD67029M-485-250**	**-**	Gateway M-Bus to Modbus on RS485 (up to 250 slaves connected to M-Bus)

ACCESSORIES:

Order Code:	**APW040**	-	Power Supply for M-Bus Master device that supports up to 40 Slaves
Order Code:	**APW080**	-	Power Supply for M-Bus Master device that supports up to 80 Slaves
Order Code:	**APW160**	-	Power Supply for M-Bus Master device that supports up to 160 Slaves
Order Code:	**APW250**	-	Power Supply for M-Bus Master device that supports up to 250 Slaves
Order Code:	**AC34107**	**-**	Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m
Order Code:	**AC34114**	-	Null Modem Cable Fem/Fem DSub 9 Pin 5 m

WARRANTIES AND TECHNICAL SUPPORT:

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at www.adfweb.com.
Otherwise contact us at the address support@adfweb.com

RETURN POLICY:

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67120	Converter Ethernet to RS232/RS485	www.adfweb.com?product=HD67120
HD67119	Converter USB 2.0 to RS485 Isolated	www.adfweb.com?product=HD67119
HD67507	Gateway Modbus TCP Server to RTU Master	www.adfweb.com?product=HD67507
HD67510	Gateway Modbus TCP Client to RTU Slave	www.adfweb.com?product=HD67510